



CLAIMS

What I claim as my invention is:

1. A retractable writing tool comprising:
a rear barrel (202) and a front barrel (207) having an opening (203) and a tip (101) capable of moving between a retracted position and a protracted position;
a feeder (107) capable of conveying fluid to the tip (101) and a valve (206) having a front end (103) and a back end (104), where the front end (103) has a round face with a concave shape profile and a slit (600), the front end (103) is adjacent to the opening (203) of the front barrel (207) so that in the retracted position the tip (101) is between the front end (103) and the back end (104) substantially sealed from outside air to substantially prevent the writing fluid from evaporating to the outside air, and preventing the release of vapor fluid from within the enclosure (102) when the tip (101) is in a retracted position, where in the protracted position, the tip (101) extends through the slit (600) of the valve (206) and opening (203) of the front barrel (207), where the valve (206) is made of silicone.
2. The valve (206) of claim 1, where the valve (206) is made of rubber.
3. The valve (206) of claim 1, where the valve (206) is made of thermoplastic elastomer.
4. The valve (206) of claim 3, where the valve (206) is treated with fluorine.

5. The valve (206) of claim 1, where the valve (206) is made of thermoplastic vulcanized material including rubber cross linked with polypropylene.
6. The front barrel of claim 1, where the inner circumference of the front barrel (207) is about the same circumference or slightly less than the outer circumference around the front end (103) of valve (206).
7. The valve (206) of claim 1, where the front end (103) is separated from the inner circumference of the front barrel (207) by an open space.
8. The valve (206) of claim 1, where the back end (104) has a hole (1500) that is adapted to seal around the leading section (1700) of the cartridge (204).
9. A retractable writing tool comprising:
a front barrel (207) a rear barrel (202) and a plunger (201) capable of moving a cartridge (204) between a retracted position and a protracted position;
in the protracted position the tip (101) extends from the opening (203) of the front barrel (207), and in the retracted position the tip (101) is within the front barrel (207);
a valve (206) is within the front barrel (207) and adjacent to the opening (203) so that in the retracted position the tip (101) is between the front end (103) and the back end (104) of the valve (206) substantially sealed from outside air.

10. The valve (206) of claim 9, where the valve (206) has at least one cavity (901) to position the valve (206) at a predetermined position within the front barrel (207).
11. The front barrel (207) of claim 9, where the front barrel has at least one tab (1600) that is adapted to engage with at least one cavity (901) to position the valve (206) at a predetermined position within the front barrel (207).
12. The cartridge (204) of claim 9, where the cartridge (204) has at least one flat (2000) adapted to engage within the rear barrel (202), the rear barrel (202) adapted to receive the flat (2000) for guiding the cartridge 204 along an axially direction without rotating.
13. The valve (206) of claim 9, further including a tension device (1000) around the front end (103) to substantially close the slit (600) when the tip (101) is in the retracted position.
14. The tension device (1000) of claim 13, where the tension device (1000) is a ring.
15. The tension device (1000) of claim 13, where the tension device (1000) is an elastic band.
16. The valve (206) of claim 9, where the valve (206) is made of rubber.
17. The valve (206) of claim 9, where the valve (206) is made of silicone.

18. The valve (206) of claim 9, where the valve (206) is made of thermoplastic vulcanized material including rubber cross linked with polypropylene.
19. The valve (206) of claim 9, where the front end (103) has a concave shape profile with a slit (600) that is formed along the longitudinal axis (301).
20. The valve (206) of claim 9, where the front end (103) has a convex shape profile with a slit (600) that is formed along the longitudinal axis (301).
21. The valve (206) of claim 9, where the front end (103) has a substantially flat profile with a slit (600) that is formed along the longitudinal axis (301).
22. The valve (206) of claim 9, where the front end (103) has an outer circumference, and further including an array of ribs (1400) along the outer circumference to support the front end (103) to close the slit (600).
23. The valve (206) of claim 9, where the back end (104) has a hole (1500) that is adapted to seal around the second leading section (1702) of the cartridge (204).
24. A retractable writing tool having a valve (206) to seal a tip (101), the valve (206) comprising:

a front end (103) and a back end (104), where the front end (103) and the back end (104) form an enclosure (102), the front end (103) having a concaved shape profile with a slit (600) that opens to allow the tip (101) to pass through when the tip (101) of the writing tool is in a protracted position, and when the tip (101) of the writing tool is in a retracted position, the tip (101) is within the enclosure (102);

a tension device (1000) supports the front end (103), the inner circumference of the front barrel (207) supports the back end (104) to substantially seal the enclosure (102) from outside air and prevent the loss of vapor fluid from escaping through the front end (103) and back end (104) of the valve (206), where the valve is made of rubber.

25. The valve (206) of claim 24, where the tension device (1000) around the front end (103) to support the closing of slit (600) to withstand between 0 and 4 pounds of vapor pressure from within the enclosure (102).

26. The valve (206) of claim 24, where the diameter of the hole (1500) is less than the diameter of the second leading section (1702) of the cartridge (204) to substantially seal the hole (1500) to withstand between 0 and 4 pounds of vapor pressure from within the enclosure (102).

27. The valve (206) of claim 24, where the front end (103) has an oval face, where the oval face has an elongated edge, where the slit (600) is formed along the longitudinal axis (301).

28. A valve (206) for sealing a tip (101) of a writing tool (100) from the outside air, the valve (206) comprising:

a front end (103) having a concave shape profile with a groove formed along the longitudinal axis (301);

the groove has a thin layer of material between the inner and outer walls of the front end (103);

the groove is pierced when the tip (101) of the writing tool is forced through it by pushing down on the plunger (201) at the back of the rear barrel (202) and protracting the tip (101) of the writing tool.

29. The valve (206) of claim 28, where the front end (103) has a groove when pierced forms a slit (600) that opens when the tip (101) is in the protracted position and closes when the tip (101) is in the retracted position.

30. The valve (206) of claim 28, where the front end (103) has a concave shape profile.

31. The valve (206) of claim 28, where the front end (103) has a convex shape profile.

32. The valve (206) of claim 28, where the front end (103) has a substantially flat profile.

33. The valve (206) of claim 28, where the valve (206) is made of rubber.

34. The valve (206) of claim 28, where the valve (206) is made of silicone.

35. A system for moving a tip (101) of a writing tool between a retracted position and a protracted position, the system comprising:
a valve (206) having a front end (103) and a back end (104) and a cartridge (204) having a leading section (1700) with a first opening (302) adapted to receive a tip (101), the leading section (1700) having a first leading section (1701) tapering downward towards the first opening (302) along a longitudinal axis (301), a second leading section (1702) forms a seal with a hole (1500) in the back end (104) of the valve (206) when the tip (101) is in the retracted position, and a third leading section (1703) tapering downward towards the elongated portion (105) and including an array of cavities (1800) that extend back along the elongated portion (105) to minimize the surface area of the elongated portion (105) and collect fluid residue that is built up on the elongated portion (105) as the elongated portion (105) moves into the valve (206) and collects fluid condensation from within the enclosure (102).

36. The system according to claim 35, where the third leading section (1703) has recess areas along the elongated portion (105) to form a gap between the back end (104) and the third leading section (1703) as the third leading section (1703) moves through the hole (1500) in the back end (104).